

***Anguis melanostictus* Schneider, 1801, a Valid Species of *Barkudia* (Sauria: Scincidae) from Southeastern India**

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Abstract.— *Anguis melanostictus* Schneider, 1801, based on a watercolor in Russell (1796), from the Coromandel coast of India, is shown to be a species of *Barkudia*, nonconspecific with *B. insularis* Annandale, 1917, and is revived. *B. melanosticta*, is compared with the holotype and other specimens of *B. insularis* from Orissa State, and shown to be larger (SVL 161.0–164.9 mm, vs. 107.0–143.0 mm), in addition to differing in the following characteristics: palatal teeth present (vs. absent); anterior lobe of tongue distinctly narrowed (vs. not differentiated); and lobules around ear opening absent (vs. present). A neotype of *Barkudia melanosticta* (Schneider, 1801) is designated, based on an adult female from Visakhapatnam, Andhra Pradesh State, southeastern India (ZSI 20627).

Key words.— Sauria, Scincidae, *Anguis melanostictus*, *Barkudia insularis*, *Barkudia melanosticta*, neotype designation, Andhra Pradesh, southeastern India

Introduction

Patrick Russell (1726–1805), perhaps the first Western herpetologist in India, a medical doctor by training, was posted as naturalist by the British East India Company at Vizagapatnam (at present Visakhapatnam, Andhra Pradesh, southeastern India). Russell is best known for a two volume folio of watercolors of snakes, published in 1796 and 1801–1802 (finished between 1807–1810; see Adler, 1989; Zhao and Adler, 1993), that concentrated on the fauna of the region. Russell's books are unique in that he used local vernaculars of the species illustrated, but not their scientific or English names, and several leading herpetologists of the time have named new species on the basis of the watercolors in Russell. Accounts of the life of Patrick Russell can be found in Adler (1989) and Smith (1931). The only reptile that is not a snake described and illustrated in Russell (1796: 48; Pl. XLII), a blind worm snake (*Typhlops*)-like reptile, was named *Anguis melanostictus* by Schneider, 1801. Russell referred to the species only by the local vernacular name, Rondoo talooloo pam (an obvious corruption of 'renda talu pam', Telugu for two-headed snake), and referred the species to the genus *Anguis*. Subsequent workers (e.g., Gray, 1845; Günther, 1864) have assigned the species provisionally to the genus *Anguis*, the latter author crediting the name, in error, to Merrem (1820). The species is unlisted in the next several major works on the herpetology of the region, including Boulenger (1890) and Smith (1935).

Because the description was substantial, including details of scalations, coloration and scale counts, it is clear that the species illustrated by Russell and named as *Anguis melanostictus* by Schneider (1801) is a species of *Barkudia*, known to be endemic to the east coast of peninsular India (see Smith, 1935). Diagnostic features described by Russell (1796) matches only this genus amongst all other southern Asian species of scincids: ventrals 151; head and neck subequal; the forehead covered with "laminae of unusual shapes" (fide Günther, 1864); teeth small, numerous; eyes lateral, small; nostrils small; trunk cylindrical, of the small thickness throughout the body; body scales imbricate; each with a black dot, and eight to 10 parallel dotted lines forming a line that runs from the head to the end of the tail; length 10.5 inches; tail round, smooth, its tip blunt; tail length 4.5 inches; color reddish-brown; ventrals and subcaudals glossy white.

The genus *Barkudia* and its type species, *B. insularis*, was established on a single specimen of a legless scincid from Barkuda Island, Chilka Lake (19° 46'N; 85° 20'E), Ganjam District, Orissa State, Eastern India, by Annandale (1917). Smith (1935) provided a redescription of the species, expanding the original description based on a reexamination of the holotype at the Zoological Survey of India (ZSI). No further species of the genus has been described and Greer (1970), in his analysis of the phylogenetic relationships of scincid lizards, included the genus in the subfamily Scincinae. Although subsequent specimens have been found at the type locality (Annandale,



Figure 1. The neotype of *Barkudia melanosticta* (ZSI 20627). Bar = 20 mm.

1921; also ZSI 22540, collected from the type locality on 5 July, 1961), and from adjacent Nandan Kanan Biological Park (20° 13'N; 85° 50'E), Cuttack District, Orissa State (Biswas and Acharjyo, 1980), little is known of its biology (see Murthy, 1990a; 1990b).

Ganapati and Nayar (1952) reported *Barkudia insularis* from Waltair (17° 44'N; 83° 23'E; close to Visakhapatnam; 17° 42'N; 83° 18'E), Andhra Pradesh State, Southeastern India, at a distance of circa 300 km to the southwest of the type locality of *B. insularis*, and Ganapati and Rajyalakshmi (1955:279) noted that the type of the species was reported lost. Several subsequent publications (e.g., Murthy, 1990a; Pillai and Murthy, 1982; Sanyal, 1993; Sanyal *et al.*, 1993; Subba Rao, 1996) uncritically accepted the Waltair locality and listed the Andhra Pradesh locality for the species, although both Tikader and Sharma (1992) and Welch *et al.* (1990) omit this southern record. The recent rediscovery of the holotype of *B. insularis* by Das and Dattagupta (1997), permits an examination of this and additional material and a comparison with material from Waltair reveal that the Andhra Pradesh material is not conspecific with *B. insularis*. This paper redescribes the Southeast Indian material and designates a neotype.

Material and Methods

The following measurements were taken with dial vernier caliper (to the nearest 0.1 mm): snout-vent length (SVL; from tip of snout to vent), tail length (TL; from vent to tip of unregenerated tail), tail width (TW; measured at base of tail); head length (HL; distance between angle of jaws and snout-tip), head width (HW; measured at angle of jaws), head depth (HD; maximum height of head, from occiput to throat), body width (BW; greatest width of body), eye diameter (ED; greatest diameter of orbit), eye to nostril distance (E-N; distance between anteriormost point of eyes and nostrils), eye to snout distance (E-S; distance between anteriormost point of eyes and tip of snout), eye to ear distance (EE; distance from anterior edge of ear opening to posterior corner of eyes), inter-

narial distance (IN; distance between nares), and interorbital distance (IO; between orbits).

Comparative material of *Barkudia insularis* examined includes: ZSI 18075 (holotype of *Barkudia insularis* Annandale, 1917), Barkuda Island, Chilka Lake, Orissa, Eastern India; ZSI 22540; Barkuda Island, Chilka Lake, Orissa, Eastern India; ZSI 24086.1 and 24086.2 (Nandan Kanan Biological Park, Cuttack District, Orissa, Eastern India).

Systematic account

Barkudia melanosticta (Schneider, 1801) nov. comb. (Figs. 1-2)

Neotype. ZSI 20627 (adult female), Visakhapatnam (17° 42'N; 83° 18'E), Andhra Pradesh State, Southeastern India, 47.8 m above mean sea level, collected by P. N. Ganapati, 17 August 1954. The type locality is indicated in Fig. 3.

Other material. ZSI 25135 (adult female), collected by M. V. Subba Rao, 1984.

Diagnosis. A member of the genus *Barkudia* Annandale, 1917, *B. melanosticta* (Schneider, 1810), can be distinguished from *B. insularis* Annandale, 1917, as follows: larger size (SVL 161.0-164.9 mm, vs. 107.0-143.0 mm); palatal teeth present (vs. absent); anterior lobe of tongue distinctly narrowed (vs. not differentiated from the posterior lobe of tongue); and lobules around ear opening absent (vs. present).

Description of neotype. Adult female. Snout-vent length 164.9 mm; head elongated (HL/SVL ratio 0.05), narrow (HW/SVL ratio 0.04), depressed (HD/HL ratio 0.61), indistinct from neck; snout long (E-S/HW ratio 0.74), longer than the eye diameter (ED/E-S ratio 0.33), projecting beyond mandible; parietal eye absent; supraoculars three, supraoculars II and III largest; supraciliaries present; scales on snout and forehead smooth; rostral emarginate laterally, contacting supranasals posteriorly; rostral large, lacking rostral groove, wider than deep (rostral width = 3.0 mm; rostral depth = 1.7 mm; width/depth ratio 1.76), con-

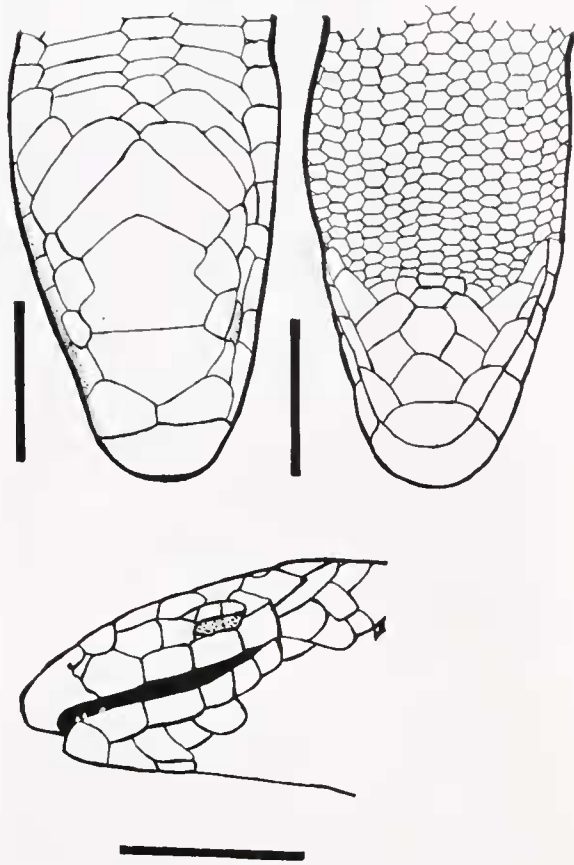


Figure 2. Head of the neotype of *Barkudia melanosticta* (ZSI 20627) in dorsal (top left), ventral (top right) and lateral (bottom) views. Bars = 5 mm. 20627). Bar = 20 mm.

tacted posteriorly by two nasals and two semicircular supranasals that are narrowly in contact. Posteroventrally, rostral in contact with supralabial I. Nares slit-like, situated within nasals, oriented laterally; nasals in narrow contact with supralabial I. Supranasals contact supralabial I laterally and frontonasal posteriorly; frontonasal trapezoid, wider than long, contacting supranasals anteriorly and frontal posteriorly; frontal deeper than frontonasal, constricted laterally, where it contacts supraocular I; at its posterior end, frontonasal contacts a V-shaped interparietal, which is wider than frontal, a single pair of parietals contacts interparietal; a single preocular between loreal and orbit. Eye reduced (ED/HL ratio 0.18), orbit situated dorsolaterally; four supralabials (supralabial III in suborbital position), supralabial IV largest; supralabial followed by a single small scale; infralabials 4; upper eyelids undeveloped; lower eyelids scaly; two postoculars; a single anterior and two posterior temporals; ear opening minute, slitlike, measuring 0.05 mm; situated laterally at approximately the level of jaws; lobules

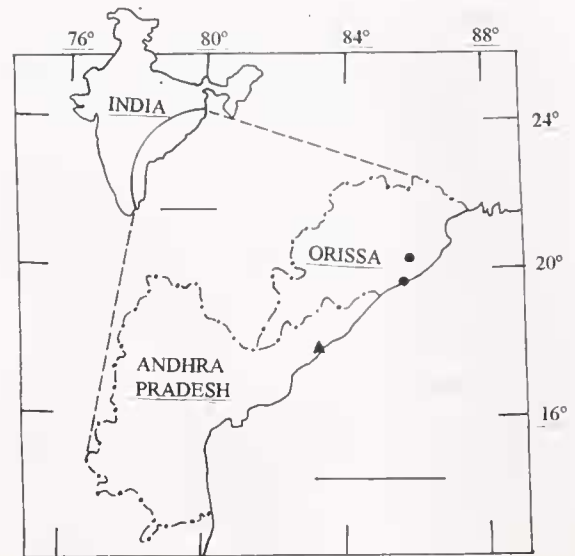


Figure 3. Map of India (marker = 800 km), showing (enlarged on right; marker = 400 km) eastern and southeastern India, and the distribution of the two species of *Barkudia*. Reference: Spots, *B. insularis* (both in Orissa State); triangle, *B. melanosticta* (in Andhra Pradesh State). See text for details.

around ear opening absent; eye-to-ear distance less than eye-to-nostril distance (E-E/E-N ratio 1.19). Inner rim of upper jaw smooth. Mental large, semicircular, wider than deep, single trapezoidal postmental, larger than mental, its width 0.29 per cent head width. Postmental contacts infralabial I, but fails to contact infralabial II, bounded posteriorly by a pair of smooth, rounded, juxtaposed chin scales that are separated by a single scale. Tongue narrowly elongate, distinctly narrowed distally, with a median cleft and scattered papillae on the dorsal surface. Palate with teeth arranged in a regular series: maxillary and mandibular teeth oriented towards the posterior, regularly arranged.

Body slender, elongate (SVL/BW ratio 0.04). Scales smooth, scale size subequal dorsally as well as ventrally. Anals three, smooth; preanal not enlarged, overlapped by the last ventral; two scales border anal laterally, exceeding its posterior level, over vent. Limbs absent. Tail short, tail length 67.5 mm, much shorter than snout-vent length (TL/SVL ratio 0.41), tail base slightly swollen and bluntly rounded at tip. Ventral surface of tail with smooth, undifferentiated subcaudals; scales on the postanal region and at the proximal part of the tail base smooth.

Coloration. (in alcohol) Dorsally yellowish-brown, turning chestnut brown towards the posterior half of tail; the tail tip (last 5 mm of tail) dark brown dorsally and ventrally, except for a pale yellow spot on the

ventrum. Ventrums of body uniformly yellow-cream. In life, these lizards are typically "glossy brown with a black spot in the middle of each scale" (Ganapati and Rajyalakshmi, 1955).

Measurements. (neotype, followed by ZSI 25135 [an adult female]; in mm) SVL 164.9 (161.0); TL 67.5- original unregenerated (32.2- partially regenerated); TW 4.7 (5.1); HL 8.7 (6.7); HW 6.6 (6.2); HD 5.3 (4.9); BW 6.8 (6.3); ED 1.6 (1.2); E-N 3.2 (3.1); E-S 4.9 (4.1); E-E 3.8 (3.3); IO 4.7 (5.0); and IN 3.3 (3.5).

Scutellation. (neotype, followed by ZSI 25135 in parentheses).- Ventrals (between postmental and preanal) 145 (143); subcaudals 78 (36+); supralabials 4 (4) (III in suborbital position in both types); infralabials 4 (4); and midbody scale rows 20 (20).

Variation. The non-type differs from the neotype in the following details: anal divided, lateral scales do not exceed level of anal; which bear fine keels and first scale following postmental contacts infralabial I. In the original description, the subcaudal count given (120) is significantly larger than that shown by the neotype- 78 (tail-tip regenerated in the non-type), but it is likely that adult males (of which no specimens have been examined) have longer tails and therefore, larger subcaudal counts. For instance, in a single male *Barkudia insularis* (ZSI 18075) examined, the subcaudal count was 108, as opposed to 82 in the only female (ZSI 24086) with an original tail.

Natural history. Several authors have provided information on the natural history of *Barkudia melanosticta*, including Ganapati and Nayar (1952), Ganapati and Rajyalakshmi (1955), Subba Rao (1996) and Subba Rao and Nageswara Rao (1998). The local protection given to the new species has precluded the collection of additional specimens.

Comparisons

The species being revived from obscurity is clearly a member of the genus *Barkudia* Annandale, 1917, due to the following features: fore and hind limbs absent, upper eyelids undeveloped, lower eyelids scaly, eyes vestigial, ear opening slitlike; nares situated in nasal, and body elongated. These features, in combination, separate members of the genus *Barkudia* from two other genera (both monotypic) of limbless scincids to which it is apparently closely related, including *Sepsophis* Beddome, 1870, containing *Sepsophis punctatus* Beddome, 1870, from the Eastern Ghats of Southeastern India and *Chalcidoseps* Boulenger, 1887, containing *Chalcidoseps thwaitesii* (Günther,

1872), from the Knuckles Range of Central Sri Lanka (see Smith, 1935, for diagnoses).

Barkudia melanosticta (Schneider, 1801) differs from *B. insularis* Annandale, 1917, in the following features: palatine teeth present (vs. absent); anterior lobe of tongue narrowed (vs. not differentiated); and lobules around ear opening absent (vs. present). The two specimens known are larger (SVL 161.0 and 164.9 mm) than the four (see Materials and Methods) examples of *B. insularis* (SVL 107.0- 143.0 mm) examined.

Barkudia melanosticta is known only from the Andhra University Campus at Visakhapatnam (northeastern Andhra Pradesh State, southeastern India), and is thus separated from the two known localities of *B. insularis* by a distance of circa 300 km to the southwest. Most of Russell's collections were presumably made in and around Visakhapatnam, ca. 5 km southeast of Waltair, the only known locality of *B. melanosticta*.

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